REMARKS

Claims 1-3, 5-13, 15-17 and 19 are all the claims pending in the application.

I. Response to Rejection of Claims 1-3 and 5 under 35 U.S.C. §103(a)

Claims 1-3 and 5 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over EP 0 725 156 (corresponding to US 5,695,576).

Applicants respectfully traverse the rejection.

Claim 1 is directed to a weldable component of structural steel, wherein the chemical composition comprises, by weight:

$$0.10\% \leq C \leq 0.22\%$$

$$0.50\% \leq Si \leq 1.50\%$$

$$0\% < Al \leq 0.9\%$$

$$0\% \leq Mn \leq 3\%$$

$$0\% \leq Ni \leq 5\%$$

$$0\% \leq Cr \leq 4\%$$

$$0\% \leq Cu \leq 1\%$$

$$0\% \leq Mo + W/2 \leq 1.5\%$$

$$0.0005\% \leq B \leq 0.010\%$$

$$0\% < N \leq 0.025\%$$

optionally at least one element selected from V, Nb, Ta, S and Ca, at contents of less than 0.3%, and/or from Ti and Zr at contents of less than or equal to 0.5%, the remainder being iron and impurities resulting from the production operation, the contents of aluminum, boron, titanium and nitrogen, expressed in thousandths of %, of the composition also satisfying the following relationship:

$$B \geq \frac{1}{3} \times K + 0.5, \qquad (1)$$

with $K = \text{Min}(I^* ; J^*)$

$I^* = \text{Max}(0 ; I)$ and $J^* = \text{Max}(0 ; J)$

$I = \text{Min}(N ; N - 0.29(Ti - 5))$

$$J = \text{Min}\left(N ; 0.5\left(N - 0.52\ Al + \sqrt{(N - 0.52\,Al)^2 + 283}\right)\right),$$

the contents of silicon and aluminum of the composition also complying with the following conditions: if C > 0.145, then Si + Al < 0.95; whose structure is bainitic, martensitic or martensitic-bainitic and also comprises from 3 to 20% of residual austenite; and the chemical composition also satisfies the following relationship: %Cr + 3(%Mo + %W/2) ≥ 1.8.

It is submitted that US '576 does not teach or suggest the claimed steel.

First, in view of the relationship between C, Si, Al, Si and Al in the present invention, there is no overlap in the compositions. That is, in the present invention, when C is > 0.145, Si + Al has to be < 0.95%. In contrast, in US '576, C has to be 0.15% (and less than 0.35%) and Si + Al has to be 1%. *See* Attached Figure.

Second, the present invention and US '576 are directed to two different utilities of technical solutions. US '576 is directed at improving the ductility of steel having a high tensile strength and being weldable. The object of US '576 is not to improve weldability or tensile strength. This can be seen from the disclosure of US '576 at column 1, and more specifically from column 1, lines 23-25 (related to drawback of the prior art) and column 1, line 66 to column 2, line 5, and more specifically lines 4-5 (related to the aim of the invention).

In contrast, the object of the present invention is to improve the quenchability of a structural steel without reducing weldability. *See* page 2, lines 12-14 of the specification.

Third, main differences in technical solutions result in the differences in the technical utilities. US '576 describes a steel having sufficient C content in which Si and/or Al are added in order to obtain residual austenite having sufficient carbon content in order to be able to be transformed into martensite under plastic deformation, and thus to increase the degree of uniform elongation, i.e., the ductility. This is evident from the disclosure of US '576 at column 4, lines 19-50 that Si is not necessary, but it is the sum of Si + Al that is necessary. This steel can also contain boron, but it is not necessary. *See* col. 5, lines 32-35.

In contrast, in the present invention, the steel has to contain boron and sufficient silicon in order to obtain a synergistic effect of B and Si on the quenchability. *See* page 4, lines 19-29 of the present specification. In this regard, Al is not necessary, and it is not the sum of Al + Si that is considered.

Moreover, it is submitted that Example F of US '576 is outside the scope of the present invention. In Example F, C = 0.152 and Si + Al = 0.928 + 0.954 = 1.882, which is much higher than 0.95%, and Cr + 3Mo = 1.047 + (3 x 0.215) = 1.692% , which is significantly less than 1.8%.

For at least the above reasons, it is submitted that claim 1 is patentable over US '576.

In addition, claims 2-3 and 5 depend from claim 1, and thus it is submitted that these claims are patentable for at least the same reasons.

In view of the above, withdrawal of the rejection is respectfully requested.

II. Rejection of Claims 1-3 and 5 under 35 U.S.C. §103(a)

Claims 1-3 and 5 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over EP 0 974 677.

Applicants respectfully traverse the rejection.

It is submitted that EP '677 does not teach or suggest the claimed steel.

EP '677 describes a steel which use is completely different from the steel of the present invention. This can be seen from the title and it is explained in [0001], that EP '677 relates to a press formable, high strength steel sheets having high flow stress during dynamic deformation. These sheets are usable for automobile members to provide safety of passengers by efficiently absorbing the impact energy of a collision. This is achieved by obtaining a steel whose structure comprises retained austenite able to be transformed under plastic deformation. *See* [0010]. Specifically, as explained in [0028] of EP '677, Si and Al are added because they are essential for retention of austenite. *See* line 37. Further, boron is not necessary, and is optionally added for strengthening of the grain boundaries and of the steel. *See* [0031], line 13 at page 10.

Thus, the steel of EP '677 is very different from the steel of the present invention. Accordingly, none of the examples of EP '677 are within the scope of claim 1.

Regarding Example 27 (Table 5, page 24), it is submitted that C = 0.25%, Si = 1.5%, and Al = 0.04%, and thus Si + Al = 1.54%, which is significantly higher than 0.95%. Moreover, there is neither chromium nor molybdenum present. Therefore, Cr + 3 Mo = 0%, which is contrary to claim 1, in which Cr + 3 Mo is higher than 1.8%.

For at least the above reasons, it is submitted that claim 1 is patentable over US '576.

In addition, claims 2-3 and 5 depend from claim 1, and thus it is submitted that these claims are patentable for at least the same reasons.

In view of the above, withdrawal of the rejection is respectfully requested.

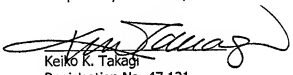
III. Conclusion

For the foregoing reasons, reconsideration and allowance of claims 1-3, 5-13, 15-17 and 19 are respectfully requested.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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